

Effectiveness of Centralized Procurement Systems in Public Sector Enterprises of Bangladesh: A Focus on Economic Census 2013

Dissertation

submitted in partial fulfillment of the requirements for the
Degree of Masters in Procurement and Supply Management

Submitted by:

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Student registration no. 14282034

Batch #7, Semester: Fall 2014

**Masters in Procurement and Supply Management
(MPSM)**

December 2014



BRAC Institute of Governance and Development
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Supervised by:

Professor Dr. Nazrul Islam

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Eastern University, Dhaka

December 2014



**BRAC Institute of Governance and Development
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DECLARATION

I hereby declare that I am the sole author of this dissertation.

I confirm that this report has not been accepted for any degree and is not currently submitted in candidature of any degree.

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CERTIFICATE

This is my pleasure to certify that the dissertation entitled “Effectiveness of Centralized Procurement Systems in Public Sector Enterprises of Bangladesh: A Focus on Economic Census 2013” is the original work of Md. Taslimul Islam that is completed under my direct guidance and supervision. So far as I know, the dissertation is an individual achievement of the candidate’s own efforts, and is not a conjoint work. I also certify that I have gone through the draft and final version of the dissertation and found it satisfactory for submission to BRAC Institute of Governance and Development (BIGD), BRAC University in partial fulfillment of the requirements for the degree of Masters in Procurement and Supply Management (MPSM).

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Md. Taslimul Islam

Abbreviations used

| | |
|------------|---|
| BBS | Bangladesh Bureau of Statistics |
| CLAN | Centre-Led Action Network |
| DD | Deputy Director |
| DDO | Drawing and Disbursing Officer |
| DPD | Deputy Project Director |
| GPA | Government Procurement Agreement |
| HQ | Headquarters |
| ICR | Intelligent Character Recognizer |
| ICT | Information and Communication Technology |
| JD | Joint Director |
| KPI | Key Performance Indicator |
| NAO | National Audit Office |
| NSO | National Statistical Organisation |
| O & M | Operational & Maintenance |
| OECD | Organisation for Economic Cooperation & Development |
| OMR | Optical Mark Reader |
| PBS | Palli Bidyut Samity |
| PD | Project Director |
| PPR | Public Procurement Rules |
| REB | Rural Electrification Board |
| RSO | Regional Statistical Officer |
| SCAN | Strategically Controlled Action Network |
| SI | Statutory Instruments |
| SME | Small and Medium Sized Enterprises |
| UK | United Kingdom |
| USO | Upazilla Statistical Officer |
| WTO | World Trade Organisation |

Abstract

Procurement constitutes a major part of expenditures in an organisation. In private sector organisations where profitability is the main objective, a little cost savings in procurement can lead to big contribution to the profitability. In case of public sector organizations, service to people rather than profitability is the main objective and achieving value for money (economy, efficiency and effectiveness) is the main consideration in procurement. Although procurement and purchasing are used interchangeably, they have subtle differences. However, in this paper procurement and purchasing have often been used interchangeably as it deals with only the buying of goods and services by the Economic Census project authority. In case of an effective procurement, the concept of 'five rights' is a much-talked-about phrase. It means 'to acquire right amount of goods in right quality for right price at right time in the right place'.

There are various systems of procurement to be followed by both private and public sector organisations. Centralised and decentralised systems are prominent. Some hybrid systems are in vogue now-a-days. All the systems have some advantages and weaknesses. Public sector organisations have wide range of choices for using any of the systems in order to achieve value for money. Debates are going on about the effectiveness of centralisation of procurements. Attempt has been made to study the effectiveness of such system. So the main objective of this study is to assess the effectiveness of centralised procurement system in Economic Census in particular and public sector in general.

In this study due to obvious reason we have selected only one project named Economic Census 2013 as our field of study. The effectiveness was assessed on the basis of quality of materials purchased, economy of scale achieved and improvement of lead time. Based on this study it is very difficult to comment about the effectiveness of centralised system of procurement in public sector as a whole.

The study relied on both primary and secondary sources for necessary data and information. Questionnaire survey was the source of primary data. A structured questionnaire has been used for this purpose. Questionnaire survey was conducted on 10 different level-BBS-officers those who had experience of purchasing goods. As various sections of officials engaged in procurement were covered under questionnaire survey, the study is a representative one which can be deemed as the reflection of views of all officials involved in implementation of the Economic Census operation.

In our study it is found that there is a significant difference between the previous and present systems of procurement. Eventually both of them have some advantages and weaknesses as well. The quality and price have significantly improved in centralised system but the lead time of the procurement has deteriorated. It means that although right quality of goods was procured at right price but they could not be procured in right time.

The findings of the study reveal that the present process of purchasing is effective for the Economic Census with a problem in lead time which should be addressed. So the cost-quality-time triangle or “the iron triangle” in which a balance is stricken between the three has to be considered in case of public procurement. For this reason, a hybrid system has been recommended as a more effective system. This system has been running successfully in a public sector organisation REB by name.

1.1 Background of the study

Procurement plays an important role in an organisation. Its main purpose is to acquire right amount of goods and services in right quality for right price at right time in the right place. In case of private sector for-profit organisations procurement has great impact on profitability. But as public sector organisations do not usually deal with profitability the main purpose of procurement is to achieve value for money (economy, efficiency and effectiveness).

Procurement can be conducted in a centralised or decentralised way. There are also some hybrid systems. Every system has advantages and disadvantages. In Bangladesh, various systems are in place in various departments. Economic Census 2013 of Bangladesh Bureau of Statistics (BBS) has been using the centralised system of procurement although decentralised system was followed in Economic Census 2001.

BBS has been conducting Economic Census since 1986 and, meanwhile, three rounds have been completed. The first Economic Census entitled '*Census on Non-farm Economic Activities and Disabled Persons*' was conducted in December 27-29, 1986 throughout the country. It covered both establishments and households with economic activities and kept agricultural households outside the purview of the economic census. The second Economic Census of the country was held in two phases: the first phase in 27-31 May 2001 in the urban areas and the second in 20-26 April 2003 in rural areas. It covered all non-farm economic activities both in urban and rural areas including three types of economic units such as permanent and temporary establishments and premises based household economic activities were covered.

The third Economic Census was conducted during 31 March to 31 May 2013 across the country to measure the nature of structural change occurring in the economy over the last decade, and to provide comprehensive statistical information for economic and social development planning, policy making. Data collection was carried out in two phases: first phase during 15-24 April 2013 in 37 districts and second phase during 15-24 May 2013 in 27 districts. The census has covered both economic households and all sorts of

temporary and permanent establishments.

The second Economic Census followed decentralised system of procurements. Funds were allocated to the concerned field offices according to the demand and the field offices purchased materials. The problem found in that census was about the heterogeneity and low quality of goods which was attributed for low quality of data. Cost was also deemed to have increased. So in Economic Census 2013 centralised system of procurement has been used. There were observations about it that goods did not reach the field offices at right time which had affected the field operation of census. This study has been undertaken with a view to evaluate the effectiveness of this centralised procurement.

1.2: Research Questions

This study intends to know about the effectiveness of centralised procurement system in public sector with emphasis on Economic Census 2013 of BBS. For this study; research questions are: -

- What variables are affecting the effectiveness of the present practice?
- Is the centralised procurement in Economic Census 2013 of BBS effective?
- If not what others alternatives are available?

1.3: Objectives of the study

The main objective of this study is to assess the effectiveness of centralised procurement system in public procurement. Specific objectives of the study are:

1. To explore the procurement systems used by the public sector enterprises in Bangladesh.
2. To identify which procurement system is more effective to achieve value for money in public procurement in Bangladesh.
3. To suggest some measures to overcome the flaws of the present government procurement systems in Bangladesh.

1.4 Rationale of the study

Public procurement is aimed at achieving value for money. Value for money can be achieved through any system of procurement. Although decentralised approach places the procurement function closer to the needs of the final user, is likely to be more economically efficient and better able to promote the development of the private sector, including small and medium-sized enterprises (SMEs), a centralised approach to public procurement is widely accepted as the preferred system in order to achieve economies of scale and uniformity.

But does the evidence support this view? Whilst a decentralised approach may promote the development of the private sector, does it also sacrifice the potential advantages of bulk buying and economies of scale? Do adjustments need to be made to introduce elements of a centralised approach within a broadly decentralised model?

This paper: a) examines various models of procurement; b) reviews the arguments for and against centralised procurement operations; c) considers the possible impact of such systems; and (d) the effectiveness of centralised procurement in public sector focusing on the Economic Census project 2013.

1.5 Scope and limitations

The study has only focused on the procurement in Economic Census 2013 project to identify the effectiveness of centralised procurement system in public procurement. But based on only one project it is difficult to determine the effectiveness of a system. The system which was not successful in case of this project might be successful in case of others or vice versa. It depends on many factors. However, it was not possible to cover all aspects in this study for time constraints. Only procurement of goods has been taken into consideration because procurement of services was insignificant in this project.

1.6 Structure of the dissertation

The dissertation is made up of five chapters. Chapter 1 is an introduction which provides a general overview of the topic. This chapter contains background, objective, research

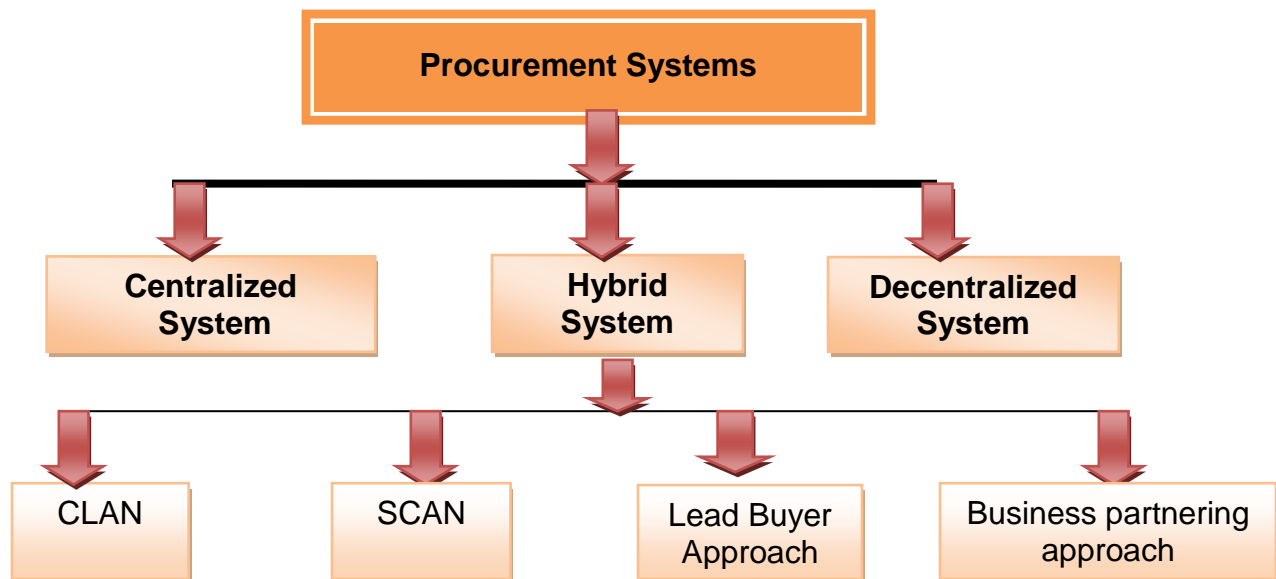
questions, rationale, scope & limitations, structure. Chapter 2 focuses on the existing literatures on various systems of procurement. Chapter 3 deals with the methodology applied for collecting and processing data. Chapter 4 encompasses an analysis of data and discussion of result. Finally, chapter 5 lays down the general conclusions and recommendations.

Chapter -Two

Literature Review

2.1 Defining procurement: The terms 'procurement' and 'purchasing' are often used interchangeably although there are subtle differences between the two. Purchasing involves the buying of goods and services in return for some form of payment. Procurement is a wider term than purchasing. It is termed as the process of obtaining goods and services in any way, including buying, hiring, leasing and borrowing. Procurement is therefore a more strategic and high-status term than purchasing (CIPS 2012).

2.2 Various Systems of procurement: There are various systems of procurement adopted by various organisations.. The common systems are centralised and decentralised systems. There is also hybrid of the two systems. The structural formation of purchasing function is dependent on numerous factors, such as, nature of business, availability of required items, elasticity of demand, condition and nature of market and so on. It is the liberty of the management to choose the appropriate one that will meet the operational requirement (*Ibid*). The available structures of procurement function most commonly used are as follows: -



Let us have a look at the pros and cons of above systems.

2.3 Centralised systems: A centralized procurement occurs when “all main procurement is controlled at one central location for the entire firm” (Leenders and Johnson 2000, 28). This structure may be described as a situation where a central purchasing department, operating on the strategic and tactical level, is found at a corporate level. This department is often responsible for product specification, supplier selection, contract negotiations and coordination of activities. While the corporation’s different business units conduct the operational purchasing activities (Van Weele 2005). Centralization of purchasing makes it possible to control the resources used and the activities performed at one place in the organization.

2.3.1 The key advantages of centralised procurement are as follows:

- (i) **Specialisation of procurement staff.** Buyers can focus on a particular area (particular skills, such as contract negotiation, or particular materials and markets, such as machinery or chemicals) and develop their knowledge to greater depth, with potential to improve quality and lower costs. If 10 procurement staff are located in 10 divisions, each of them will have general responsibility for a wide range of activities and requirements, fostering generalist knowledge and skills. If 10 procurement staff is based in a single, centralised unit, there is the opportunity for each buyer to develop knowledge in more specialised techniques, procedures or categories of procurement.
- (ii) **Potential for the consolidation of requirement:** that is, putting multiple requisitions from different units together into single, larger orders or contracts. This reduces the frequency of small orders for commonly purchased items; reduces transaction and transport costs; and enables buyers to obtain better prices (with economies of scale, bulk discounts, etc) and higher levels of service (as potentially more significant customers of suppliers). The number of suppliers is likely to be smaller, too, and order and contract administration may be more streamlined.
- (iii) **Greater co-ordination of procurement activities.** Uniform procurement policies, procedures and good practice can be introduced and applied, facilitating standardisation, variety reduction, better value for money and

improved compliance-and minimising maverick, adhoc procurements. Staff training and development can also be undertaken more systematically.

- (iv) **Greater standardisation of specifications, which may enhance quality and efficiency in a number of ways:** facilitating the consolidation of orders; reducing inventory and handling costs (less variety and greater utilisation); focusing the supplier base (fewer specialist requirements); improved quality management (ease of inspection); and simpler and more accurate communication about requirements.
- (v) **More effective control of procurement activity.** Procurement performance can be monitored and compared with defined KPIs; budgetary control may be applied to the function (and total external expenditures); and the unit may be viewed as a separate cost centre for closer accountability.
- (vi) **Avoidance of conflict between divisions,** which may otherwise arise due to competition for scarce materials, unequal budgetary allocations of procurement expenditure, or differences in value obtained in procurements.
- (vii) **Access to specialist skills, contacts and resources** (such as procurement research), which may not be available at divisional level.

2.3.2 Disadvantages of Centralized Procurement:

- Delay is caused in centralized procurement as different departments of different places will send their requirements to the purchasing department. The purchasing department will purchase the necessary items and send to other departments.
- In this case centralized purchasing branches of different places can not take advantages of localized purchasing.
- There are chances of misunderstanding between purchase department and other departments because other departments may not get their requirement according to their own will.
- Centralized purchasing is not suitable in case of perishable commodities.

- It results more cost of transportation and botheration, as it is purchased in one place and send to the distance places.

2.4 Decentralized Procurement: - A decentralized procurement occurs when “all main purchasing is controlled at the business units, and/or divisions” (Leenders and Johnson, 2000; P 28), In other words different business units are responsible for their own purchasing activities. This structure can be found in companies with a business unit structure, and where the business unit management is responsible for all its purchasing activities (Van Weele, 2005). A decentralized purchasing function is also typical for project based businesses. In such a system, the buyers are often responsible for a large variety of products, which are bought in smaller quantities compared to a centralized purchasing function.

2.4.1 Advantages of decentralised procurement are:

- (i) **Better communication and coordination** between procurement and operating departments, benefiting from user expertise and minimising maverick buying by users. In centralised procurement functions, ICT mechanisms may have to be highly developed to facilitate regular contact and data-sharing with internal customers.
- (ii) **Customer focus.** Buyers are closer to internal and external customers, so they can develop a better understanding of user needs and problems, and a big picture business focus, rather than a parochial identification with their own functional objectives. This may also help to keep procurement outward-focused, creating a culture open to learning and change.
- (iii) **Quicker response** to operational and user needs and environmental changes and problems by local buyers who are close to the scene of operations.
- (iv) **Knowledge of, and relationships with, locally based suppliers.** There are advantages in sourcing from short distances-such as reduced transport cost and environmental impacts; reduced transport risks and delivery times; the ability to personally appraise and monitor suppliers; and the ability to negotiate and resolve disputes face-to-face.

- (v) **Smaller purchase quantities:** sacrificing economies of scale, but reducing costs and risks of holding inventory, and possibly supporting social sustainability policies and innovation (by enabling small, local suppliers to bid for contracts).
- (vi) **Accountability:** divisional managers can be held accountable for performance only if they have genuine control over operations which is not the case if procurement has been taken out of their hands.
- (vii) **Freeing central procurement units** to focus on higher-level, value-adding tasks.

2.4.2 Disadvantages of Decentralized Procurement are:

- Organization loses the benefit of a bulk purchases.
- Specialized knowledge may be lacking in purchasing staff.
- There is a chance of over and under-purchasing of materials.
- Fewer chances of effective control of materials.
- Lack of proper co-operation and co-ordination among various departments.

2.4.3 Centralisation and decentralisation can be used to refer to (a) the extent to which decision-making authority is kept close to the centre of the firm ie the level of the hierarchy at which decisions are taken and the extent of delegation; (b) the extent to which related tasks and resources are gathered under a single functional authority or location eg whether there is a separate purchasing function, or whether purchasing is carried out by relevant line departments.

2.4.4 An important organisational issue is the extent to which procurement and supply chain responsibilities should be centralised (ie placed in the hands of a single department reporting to a single executive) or decentralised (ie devolved to procurement officers in different user departments).

2.4.5 The question is further highlighted in the case of multi-divisional and multi-site operations. An organisation that operates through a number of branches or divisions, perhaps separated by considerable distances, may consider a single procurement function at head office (centralisation) or separate functions at each division (decentralisation). The choice is rarely clear cut.

2.4.6 Most commentators suggest that responsibilities for supply management activities at a higher level (policy development, supplier selection and relationship management, major contract negotiations and so on) should be centralised-ie they should lie as far as possible with procurement specialists, in order to leverage core procurement and supply chain competencies (CIPS 2012).

2.4.7 However, it may not always be feasible to centralise procurements operations-

- if various divisions use and procure different materials from different external supply markets. In such cases, there may be a need for specialist expertise, relationships, systems and procedures to fit the distinctive markets and requirements of the division, and to be close to clients and customers in order to respond to their changing needs.

- if operational sites are widely dispersed geographically (especially in areas where transport and communication infrastructures are less developed). In such cases, there may be a need for a local procurement presence, to support local procurement and supply: minimising difficulties, risks and costs of long transport and communication lines.

2.4.8 Even if procurement is carried out at a local level, it is likely that there will still be a need for a centralised procurement function to carry out specialised activities, such as supply market research or the procurement of specialised and capital items. Often long-term framework contracts may be negotiated by the central procurement office, with divisional buyers or users calling off requirements against the contracts.

2.5 Hybrid systems:- Lysons and Farrington suggest that procurement and supply chain activities may be centralised across a spectrum from highly centralised to highly devolved (Lysons and Farrington, 2012).

- Centralised procurement: procurement strategy, policy, systems and standards are controlled centrally and all procurement activities are also carried out centrally. This may be suitable where the items required by each strategic business unit or plant are largely the same.
- Co-ordinated devolved procurement: procurement strategy, policy, systems and standards are controlled centrally; procurement of items common to more than one strategic business unit are usually centralised; but other operational procurement activities are carried out within the SBUs. This may be suitable where SBUs or plants produce widely dissimilar products.
- Consultative centralised procurement: procurement activities-both strategic and operational are devolved to SBUs which merely take guidance and advice from a centralised procurement function.

On the basis of these suggestions a number of specific hybrid models and approaches have been developed, of which the most popular are CLAN, SCAN, Lead buyer and business partner.

2.5.1 Center Led Action Network: - Center Led Action Network (CLAN) organizational model was launched in 1991 and is still the approach preferred by high-performing 'group' companies who want to enjoy the better of two worlds: autonomous business units within the group, and an across-the-group connection which ensures that the whole is greater than the sum of the parts. In the CLAN model, action takes place in the businesses whilst networking between them is driven from the centre.

CLAN's attraction is that it provides a powerful and more stable, yet still flexible, alternative to centralized or de-centralized management of key business functions. This is relatively decentralized model that has become popular in many large organizations. CLAN is an excellent concept, invented and described by Dr Richard Russill and Paul Steele of PMMS Consulting Group. It's main characteristics is that it posits a relatively

decentralized model, with procurement staff sitting in the different business units in an organization. Their main reporting line is to the local business, with a dotted reporting line to a small procurement "centre", usually sitting in the corporate HQ. Its basic principles are well explained by Peter Smith in *Supply Management*.

According to him CLAN model is based on staff located in many different business units. This staff primarily report to local management of their business unit, though have a responsibility to a small procurement center usually located at corporate HQ (Smith, 2003).

But CLANs are not always the right solution. There are occasions when autocratic top-down leadership is essential, for example in a time of corporate crisis. Likewise it is unlikely to be the right choice in a company that is so intent upon task that it ignores the 'processes' whereby people work together (*Ibid*).

2.5.2 The SCAN (strategically controlled action network) approach is a relatively centralised model (CIPS 2012).

- Structurally, it is similar to a CLAN, except that local procurement staff report primarily to the head-office central procurement unit.
- The central unit is responsible for strategy, policy, training and performance management. It also includes centralised category managers, who are responsible for particular categories of goods or services procured across the organisation.
- SCAN has overtaken CLAN in many large organisations which want to leverage procurement expertise-although it shares the corresponding disadvantages of centralised operations.

2.5.3 The lead buyer approach is one way in which responsibilities can be devolved in a CLAN (*Ibid*). Defined procurement responsibilities are delegated to designated members of user departments, as 'lead buyers' for a particular category of procurements. For example, a member of the manufacturing department is given responsibility for certain purchasing activities.

- The key benefit of such a structure is that user departments are closely involved in procurement decisions, where this is important for agility and local advantages.
- Lead buyers are not procurement professionals, and may require support from policies, procedures and guidance from a centralised procurement team. However, where implemented effectively, this can serve to improve communication and relationships between procurement and user departments, and to spread procurement best practice more widely in the organisation.

2.5.4 A business partnering approach is one way in which procurement guidance can be exercised in a SCAN (*Ibid*). A member of the procurement team works within a user department. He represents the procurement function, liaises with the user function, and identifies situations where procurement expertise can add value.

2.6 Effectiveness:- Effectiveness is the degree to which objectives are achieved and the extent to which targeted problems are solved. In contrast to efficiency, effectiveness is determined without reference to costs and, whereas **efficient** stands for performing or functioning in the best possible manner with the least waste of time and effort, effectiveness is adequate to accomplish a purpose; producing the intended or expected result.. In other words “*effectiveness is about doing the right things, while being efficient is about doing the things in the right manner*” (businessdictionary).

2.7 Procurement Practices in Public sector:- Public sector organisations do not usually deal with profitability. So the main emphasis of the government’s policy on public procurement is to obtain value for money. There are a number of possible procurement strategies available to public agencies. The choice of strategy depends on the culture and circumstances of the country concerned, including the level of economic and market development. The centralisation vs. decentralisation debate is not an issue of black vs. white. A system that mixes elements of decentralisation and centralisation is likely to work well in many countries (OECD, 2011).

For example in the United Kingdom, the main emphasis of the government’s policy on public procurement, which is set out in procurement guidelines, is to obtain value for

money, (defined as the optimum combination of quality and whole life cost) usually through competition. For local authorities, this is supplemented by a law passed in the 1980s, which prohibits them from taking account of non-commercial considerations when awarding contracts. In the 1990s, the UK gave effect to obligations under the European Community and WTO Government Procurement Agreement (GPA) through four sets of Regulations, or Statutory Instruments (SIs). These cover rules for the award of works, supplies and services contracts by public sector bodies and also by utilities. Each of the Regulations contains compliance provisions (*Ibid*).

The approach to procurement in the UK is best described as decentralised. Policy and practice are the responsibility of the Treasury's Procurement Group, which gives guidance and central direction to government departments (i.e. ministries). However, each department is responsible for and accountable for getting value for money from their expenditure on goods and services. Most departments have procurement units with staff who have had procurement training. Heads of Departments are accountable to Parliament for the money voted to them to carry out their duties. The National Audit Office, which reports to Parliament and is independent of Government, scrutinises departmental expenditure firstly to verify that it is authorised and has been incurred for the purpose intended, and secondly, to examine whether value for money has been achieved. Similar arrangements apply to other bodies for which departments are responsible, including the National Health Service. The NHS and local authorities are subject to audit by the Audit Commission, a statutory body that reports to Government Ministers and the public. There are similar arrangements in Scotland and Northern Ireland. One feature of the decentralised approach is that the UK does not tie departments to using central buying agencies for their procurement, but these agencies should be used where they offer best value for money. As a result of a review conducted in 1999 to look at whether the structure of procurement is suitable to meet future needs, for instance in taking full advantage of electronic commerce, a new body, the Office of Government Commerce was set up in 2000 to provide greater central co-ordination to the government's commercial activity (*Ibid*).

2.8 Procurement Practices in Public sector in Bangladesh: In Bangladesh, like UK the main emphasis of the government's policy on public procurement, which is set out in public procurement rules (PPR, 2008 amended), is to obtain value for money, usually through competition. In Bangladesh, some organisations use centralised and some use decentralised systems. Some organisations use hybrid system. For example, Rural Electrification Board (REB) has been following the CLAN approach since 2006. Previously it followed the centralised system (Firozi, 2013).

2.9 Procurement Practices in Economic Census Project 2013 of BBS: Bangladesh Bureau of Statistics (BBS) is the National Statistical Organisation (NSO) mandated to conduct various censuses and surveys with a view to collect and compile quality statistical data for national planning and policy making. Economic census is one of the important censuses carried out by BBS.

Economic Census is the complete enumeration of the full set of economic units belonging to a given population or universe at a particular time with respect to well defined economic characteristics. It is literally the whole process of collecting, compiling, processing, analyzing and publishing economic data pertaining to all economic units in a country. It is a well-structured undertaking which provides timely, reliable, accurate and detailed data on the size and distribution of economic units of different categories. The economic census is the primary source of basic benchmark statistics, covering the whole gamut of non-farm economic activities of the country (BBS, 2013).

The history of Economic Census is not as old as that of Population Census. In many countries, Population Census is the oldest census undertaking followed by Agriculture Census; and, at a later period Economic Census has been undertaken. The necessity of Economic Census or Business Census was felt with the increase of non-farm economic activities of the countries. Data collected from establishments at different tier's of administration generally help policy makers to pursue programmes for employment generation, assess private sector requirement and boost up business and industries(*Ibid*).

The Bangladesh economy has been growing fast over the last two decades. New economic activities like shipbuilding, software development, event management, security services, mobile banking services and so on are widely taking place. Agro based economy has been rapidly transforming to a mixed one with considerable income and employment opportunities. Currently, the service sector dominates the economy with lion's share in GDP. Out of total GDP, service sector constitutes 49.30 percent, industry 31.99 percent and agriculture only 18.70 percent. To measure the changing pattern of Bangladesh economy, Bangladesh Bureau of Statistics (BBS) of the Statistics and Informatics Division (SID) has been conducting Economic Census since 1986 and, meanwhile, three rounds have been completed (*Ibid*).

The first Economic Census titled '*Census on Non-farm Economic Activities and Disabled Persons*' was conducted during December 27-29, 1986 throughout the country. It covered both establishments and households with economic activities and kept agricultural households outside the purview of the economic census (*Ibid*).

The second Economic Census of the country was held in two phases: the first phase during 27-31 May 2001 in the urban areas and the second during 20-26 April 2003 in rural areas. It covered all non-farm economic activities both in urban and rural areas. Three types of economic units such as permanent and temporary establishments and premise based household economic activities were covered (*Ibid*).

The third Economic Census was conducted during 31 March to 31 May 2013 across the country. Data collection was carried out in two phases: first phase during 15-24 April 2013 in 37 districts and second phase during 15-24 May 2013 in 27 districts. One of the fundamental features of the census was *listing operation* i.e. all units irrespective of establishment or household, either permanent or temporary, were enlisted prior to the main census. Only economic units, except crop agriculture, were separated from the lists and enumerated in the main census. It may be mentioned that this step has contributed to reducing the census cost considerably and helped ensure optimum use of public resources. The census has covered both economic households and all temporary and permanent establishments (*Ibid*).

As Economic Census 2013 was a gigantic activity, it involved costs amounting to TK 188.59 crore to be spent over three years (FY 2013/14-2015/16). A huge amount of procurement has to be done for successful implementation of the project. Like other projects of BBS, centralised system of procurement has been followed in case of procurement in Economic Census. It means that project authority procured goods centrally and distributed these goods to the field offices upto the Upazila level according to the need. Previously funds were distributed to the field offices and field offices bought necessary goods according to their needs. The reason for purchasing centrally as cited by the Project Authority is to maintain uniformity and quality of goods, utilise expertise of the BBS, gain economies of scale etc.

Chapter Three

Methodology

Methodology is a body of methods, rules, and postulates employed by a discipline: a particular procedure or set of procedures (Merriam Webster dictionary 2004). In other word, methodology is the analysis of the principles or procedures of inquiry in a particular field.

According to Wikipedia, a methodology is usually a guideline system for solving a problem, with specific components such as phases, tasks, methods, techniques and tools. It can also be defined also as follows:

1. "the analysis of the principles of methods, rules, and postulates employed by a discipline";
2. "the systematic study of methods that are, can be, or have been applied within a discipline";
3. "the study or description of methods".

A methodology can be considered to include multiple methods, each as applied to various facets of the whole scope of the methodology. Generally speaking, methodology does not describe specific methods despite the attention given to the nature and kinds of processes to be followed in a given procedure or in attaining an objective.

There are several possible methods that may be applied by researchers in order to solve a stated problem situation. In general there are two distinct types of methods that may be applied: qualitative or quantitative (Dubois and Araujo 2007). The quantitative methods include simulations and model building as well as statistical testing of survey data (Ellram 1996). This method is well suited in situations where the researchers are searching for generalities and patterns in collected data (Dubois and Araujo 2007). The qualitative method is an umbrella concept covering several forms of inquiry that helps to understand and explain the meaning of a phenomenon (Merriam 1998).

3.1 Data sources and methods of collecting data in this study

The questionnaire survey was adopted for collecting primary data in this research work. Questionnaire survey was conducted on 10 different level-BBS-officers those who have experience of purchasing goods in Economic Census 2013 and 2001. Before asking for filling the questionnaire, the general idea of the research objectives were exchanged with them. After the exchange of general idea of the research objectives, the questionnaire was given to them. They were requested to fill the questionnaire based on the practical experience they had regarding the implementation of the centralised system. Both open and close questions were set in the questionnaire to reveal the real perception of the respondents. They were asked to give their perceptions regarding the impact of centralised system on the 3 KPIs i.e. quality of products, scale of price economy achieved and improvement of leads time.

3.2 Place of study and study period

Survey was conducted at BBS headquarters at Dhaka, Bangladesh from 2 November 2014 to 25 November 2014.

3.3 Sample design and determination of sample size

The purpose of this study is to find out the effectiveness of present practice of purchasing goods and services in Economic Census 2013 project. More specifically, the main purpose of this study is to assess the impact of the centralised procurement system on the procurement key performance parameters- quality, cost and lead time of goods. The main research question of this study is the extent to which present procurement practice to source goods is effective. For this purpose, questionnaire survey has been conducted on the officers of the focused BBS officials who have practical experience of purchasing goods under Economic Census.

The sample size for this study was determined to be 10 as the scope and timeframe of the study was limited and we considered a single project. Among employees involved in the purchasing functions; 4 Upazila Statistical officer (USO), 2 Deputy Directors (DD) in charge of district (formerly known as RSO), 2 Joint Directors (JD) in charge of Division,

and 2 officers of the project office (PD & DDO) were considered as key personnel. This size was selected in consultation with the BBS officials and does not based on any theory.

The sample was selected as a group of personnel from BBS who are directly involved with the purchasing process. The sample group includes the personnel who have experiences for more than ten years. The respondents include, PD, DPD (DDO), JD, Dhaka Division and Rajshahi Division, DD, Dhaka and Comilla district, USO, Rangunia (Chittagong), Balagonj(Sylhet), Lohagara (Norail) and Mehendigonj (Barisal).

As the sample size is small and within the reach of the researcher; 100% of the informants were covered under the survey.

3.4 Questionnaire design

To get the perception of the respondents regarding the effectiveness of the centralised procurement system, questions have been asked under four broad categories. It includes both open and close questions and also covers all relevant areas of this dissertation. The sample questionnaire has been exhibited at Appendix-A. In short the questionnaire is as follows:

Question 1(a): Would you please mention past and present procedure of procurement of goods by Economic Census?

Question 1(b) : Do you find any distinction between past and present procedure ?

Question 1(c) : If yes, please state main points of distinction.

Question 2: Would you please state remarkable advantages of present procedure of purchasing?

Question 3: Would you please state remarkable weaknesses of present procedure of purchasing?

Question 4:(a) Please mention extent to which the “quality” of procured materials improved by following the centralised system of procurement.

Question 4:(b) Do you think the Economic Census ensure better “price” of goods and services through present procurement practices?

Question 4:(c) If the answer of question no 4(b) is yes; please specify the scale of economy:

Question 4:(d) Please specify extent to which the “lead time” of delivering materials improved.

Question 4: (e) How effective the present procedure is?

3.5 Overview of the survey questions

As is evident from the sample questionnaire, the first three questions were asked to seek comparisons of present and previous procedures, point of distinctions, pros and cons of the present approach etc. The fourth and fifth questions cover the quality of procured goods, economy of scale achieved, improvement of lead time and overall effectiveness of procedure. The first and last questions include three and five sub-questions respectively while questions numbers 2 and 3 are complete in nature and require no supplementary enquiries.

3.6 Data collection

Data were collected from the responses of the respondents who took part in questionnaire survey. Distribution of responses and percentage of responses for these questions are presented at Appendix- B in four different tables in the following orders:

| Question no. | Covered KPIs | Table no. |
|--------------|---------------------------|-----------|
| 4(a) | Quality of goods procured | A-1 |
| 4(c) | Economy of scale achieved | A-2 |
| 4(d) | Improvement in lead time | A-3 |
| 4(e) | Overall effectiveness | A-4 |

3.7 Data analysis

Collected data have been cleaned, edited, and re-arranged for analysis and drawing a conclusion.

3.8 Report writing

Report has been written on the basis of analysed data. Microsoft Excel has been used for preparing tables and for calculation. Microsoft Word has been used for preparing the report.

Chapter Four

Finding and analysis of the findings of the Study

4.1 Findings of the questionnaire survey

Findings of the survey are described below:

4.1.1 Regarding the Comparisons of Present and past procurement practices: The following question was asked to the respondents about a comparison of the procedures of past and present systems of procurement:

Question 1 (a) : *Would you please mention, past and present procedure of purchasing goods by Economic Census ?*

In response to the above question, the respondents have given following opinions:-

In 2001 Economic Census, all field level required items were purchased by the field offices. The Regional Statistical Officers (at that time there was RSO in charge of one or more districts which now has been replaced by Deputy Director for every district and Joint Director for Division) placed demand for fund and the project office distributed fund to field offices. Field offices purchased goods according to their needs. In Economic Census-2013, the Project Office took requisition of goods from the field offices, purchased goods centrally and distributed the goods according to the need of the field offices.

4.1.2 Regarding the distinction between two procedures of purchasing:

This was a closed question providing the respondents only two options. Either they have to agree or disagree.

Question 1 (b) : *Do you find any distinction between past and present procedure ? (Please tick the right answer) Ans : Yes/No*

Out of ten three respondents said that they did not find any distinction. Seven said that they found some vital differences between the present and previous practice of purchasing.

4.1.3 Regarding the differences between previous and present systems:

This was another open question for the respondents to express their opinions independently.

Question 1 (c): *If yes, please state main points of distinction.*

Seven respondents who said yes in the answer to the question 1(b) mentioned some points of distinction between previous and present system of procurement. The points stated by them are summarised in the following Table.

| Points of differences | Previous system | Present system |
|-----------------------|--|--|
| Quality of goods | Various standards of materials were purchased by various field offices. For example, some RSOs purchased 'Staedtler' pencil and some purchased 'Notoraj'. This made differences in filling up the census questionnaires. | Under present system only materials commensurate with the required quality are procured. So materials become uniform and no problem of difference in filling up the census questionnaires. |
| Quantity | Actual quantity used to be purchased by the local offices. No extra procurement was made. | As goods are procured at a time, some extra amount of goods is procured. |
| Procurement time | In previous system, the RSO offices could purchase goods in comparatively less time as they spent less money and procured less amount of goods. | Under present system more time required as goods are procured in an aggregated way involving huge tendering procedures. |

| | | |
|--------------------------|--|--|
| Cost | Cost was a little bit more as fewer amounts were purchased. | Costs are low as large amounts are purchased. |
| Place of delivery | The goods reached right place at right time due to local purchase. | Centrally procured goods are distributed to local offices. Goods do not reach right place at right time due to distribution problem. |

4.1.4 Advantages of present system of procurement

Another qualitative question was asked to the respondents to mention the advantages of present system. It was also open to them and they mentioned the issues in light of their experiences. The question was:

Question 2: *Would you please state remarkable advantages of present procedure of purchasing?*

Respondents summarised numerous advantages of the centralised approach. Some of them are overlapping with the answers to question number 1(c). Most common advantages mentioned by them are: uniform and standard goods, low costs.

4.1.5 Regarding weaknesses of present system

The question was:

Question 3: *Would you please state remarkable weaknesses of present procedure of purchasing?*

The respondents mentioned their views regarding the disadvantages of the present procedure. Almost everybody has mentioned that the time for procurement and time to reach goods at field level are main matters of concern. They also said that at central level contractors are influential and they sometimes do not obey the instructions of project authority and the project authority is not in a position to take punitive measures against them. Besides, in 2013 when field work of Economic Census was started there was huge

political turmoil in the country. So receipt of goods from contractors and distribution of goods to the field offices were disrupted. As a result Economic Census activities were hampered.

4.1.6 Regarding the extent to which quality of materials has been improved:

In order to collect data about the quality of purchased goods respondents were asked to give their perceptions. The question was as follows:

Question 4: (a) Please mention the extent to which the “**quality**” of procured materials improved by following the centralised system of procurement.

The responses were given within a scale of 1 to 5 in which 1= Significantly Deteriorated, 2= Deteriorated, 3= Same as it was before, 4= Improved, 5= Significantly Improved. Two out of 10 respondents perceived as quality has deteriorated, 2 as same, 3 improved and 3 significantly improved. The responses to this question are demonstrated in Table A-1 at Appendix-B.

4.1.7 Regarding the extent to which the price has been reduced or economy of scale achieved:

Question 4: (b) Do you think the Economic Census ensures better “**price**” of goods through present procurement practices? (Please put tick mark) **Ans : Yes /No**

This was a close-ended question having only two choices for the respondents and in response 2 out of 10 said that they did not think centralised system ensures better price. However, 8 respondents thought that the centralised system can be able to ensure better price as bulk amount is purchased at a competitive price.

On the basis of response a supplementary question was asked requesting to specify the economy of scale ensured within scale from 1 to 5. The question was:

Question 4: (c) If the answer of question no 4(b) is yes; please specify the economy of scale:

The scales specified to response were 1= Significantly Expensive, 2= Expensive, 3= Same as before, 4= Economical, 5= Significantly Economical. Six out of 8 respondents viewed the present system as economical and the remaining 2 perceived it as significantly economical. The responses to this question are demonstrated in Table A-2 at Appendix-B.

4.1.8 Regarding the extent to which the lead time has been reduced:

The amount of time that elapses between starting of a process and ending of that process has been considered as lead time. Question was asked to quantify to what extent the lead time of sourcing materials has been reduced.

Question 4: (d) Please specify extent to which the “lead time” of delivering materials improved.

The scales specified to response were 1= Significantly deteriorated, 2= Deteriorated, 3= Same as before, 4= Improved, 5= Significantly improved. Four of out of 10 said that the lead time has significantly deteriorated, 4 viewed it as deteriorated and 2 of them thought that it remained the same. The responses to this question are demonstrated in Table A-3 at Appendix-B.

4.1.9 Regarding the overall effectiveness of centralised system of procurement:

This question was designed to seek the opinion of the respondents about the overall effectiveness of the process of procurement followed by the Economic Census 2013. The question was:

Question 4: (e) How effective the present procedure is ? (please tick the appropriate box)

These responses represent the perceptions of participating respondents regarding the present approach and responses are distributed for them in six different scales i.e. 1= very poor, 2= poor, 3= acceptable, 4= good, 5= very Good, 6= excellent. In this case we have received a mixed response. Only 1 out of 10 perceived the centralised system as poor, 3 as acceptable, 4 as good, 1 as very good and rest 1 as excellent. The responses to this question are demonstrated in Table A-4 at Appendix-B.

4.2. Analysis of findings from the questionnaire survey

The analysis of the survey findings is as follows:-

4.2.1 Comparison of previous and present procedure: It should be noted that all the respondents are aware of the present (centralised) and previous (decentralised) system of procurement and majority of the respondents (70%) could find the vital differences between the two. Seventy percent of the respondents also stated the advantages and weaknesses of the present system. So it is very clear that there are some remarkable fundamental and procedural differences between these two processes. The differences are:

- In case of centralised procurement system, quality of goods can be better ensured than decentralised system.
- Cost can be much lower in case of centralised procurement than the decentralised system.
- The lead time becomes longer in case of centralised procurement than the decentralised system.
- There might be problem in reaching goods in right place at right time in case of centralised procurement but in case of decentralised system there is less possibility of such problem.
- There is scope of procurement of extra goods in case of centralised procurement but in case of decentralised system there is less possibility of such problem.

4.2.2 Advantages and disadvantages of present centralised system

Respondents gave lists of numerous advantages of the centralised system. Most common advantages mentioned by them are as follows:

- It ensures quality.

- It ensures cost effectiveness.

The respondents also mentioned a list of disadvantages of centralised system. The most common are as follows:

- The longer lead time.
- Scope of extra procurement.

4.2.3 Quality issues of centralised system

Quality of goods or services is the degree of extent to which it is fit for the purpose. In other word, how much it has satisfied the utility of consumer or user. From the responses it is seen that only 20% of the respondents perceived that the quality has been deteriorated while 20% viewed it as same as before. However, 30% thought that quality has improved and another 30% as significantly improved. So it is evident that majority of the respondents have given their views that centralised system improved quality of goods purchased. So it can be stated that the centralised procurement has a positive impact on the quality of goods purchased.

4.2.4 Impact on price

Appropriate quality at an affordable price is an ideal situation in procurement. So the price was another important consideration of our study. From the responses it is seen that only 20% of the respondents said that they did not think that centralised system ensures better price. But majority of respondents (80%) have given their views that centralised system has lessened the price of goods procured. So it is clear that centralised system has a positive impact on price of goods purchased.

4.2.5 Impact on lead time

Lead time is the time required from start to completion of a particular process or activity. Lead time is examined closely in manufacturing, supply chain management and project management, as companies want to reduce the amount of time it takes to deliver products to the market. In business, lead time minimization is highly preferred.

It is apparent from most of the responses that 80% thought that due to centralised system lead time has increased. Only 20% said that it was same as before. So it can be said that centralised system has a negative impact on lead time.

4.2.6 Overall effectiveness of the centralised system

The final question to the respondents was about the overall effectiveness of the centralised system implemented in Economic Census 2013. Only 10% found the system poor. The rest found it acceptable (30%), good (40%), very good(10%) and excellent (10%). So it can be said that the centralised process of purchasing is quite effective in case of Economic Census 2013.

4.3 Summary of key findings

The questionnaire survey reflected views of the key officials of BBS about the centralised systems. During our study it is found that there is a significant difference between the previous decentralised and present centralised systems of procurement. Eventually both of them have some advantages and disadvantages as well. Centralised system has improved the quality and price of the procurement significantly but in case of lead time it has some deficiencies.

Chapter -Five

Conclusions and Recommendations

5.1 Conclusions

Based on the literature review, analysis and questionnaire survey, following conclusions are drawn regarding the effectiveness of centralised system of procurement in public sector procurement in general and Economic Census 2013 project in particular.

- In case of public sector procurement both ecentralised and decentralised systems are appropriate.
- In centralised system quality and price can be improved but goods might not be available in right time due to longer lead time. On the other hand, in case of decentralised system quality and price might be a bit higher but goods will be available in right time.
- So the cost-quality-time triangle what is called the 'iron triangle' is the factor in case of procurement in public sector. An organisation has to strike a balance between the three although the objective of procurement is to acquire goods at right cost, right quality and in right time. For example, in case of Economic Census many goods are strategic in nature. Even a pencil is treated as most important. Because in processing filled-up census questionnaires nowadays high-tech machines such as OMR, ICR etc. are used. If a pencil is of inferior quality, the writings will be faded away after few days and it would be difficult for the machine to read that writings. As a result the machine will give wrong information and the whole field work will be jeopardized. So high quality pencil is necessary in case of census operation. For this, the census authority does not want to make compromise with the quality of goods and they are resorting to the centralised system of procurement. The census operation takes place over a long period of

time and a little bit time lapses do not usually frustrate the whole operation. That's why the project authority compromises with the time. So centralised system seems to be more effective in case of procurement of critical census materials. However, in case of other organisation time might be more critical than cost and quality. For example, in case of acute food crisis, food department has to procure foods within shortest possible time with some compromise being made in regard to the cost and quality.

- In case of procurement of critical items, capital goods and intellectual services, the centralised system is more appropriate as the field offices lack skill and expertise. On the other hand, in case of routine items decentralised system is more appropriate as it ensures timely acquisition of required items.

So we can conclude that although the centralised system has proved effective in case of Economic Census Project it is not equally effective for all organisations in public sector.

5.2 Recommendations

It is evident from the study that centralised system has significant positive impact on the quality of goods and price of the materials purchased but has negative impact on time. On the basis of this findings following recommendations can be put forward:

- A generalised system should not be applicable for all organisations and for all goods in public sector. Different organisations can use different systems and for procurement of different items different systems can be adopted by an organisation. In this case, 'iron triangle' or 'cost-quality-time triangle' should be taken into consideration by an organisation. For example, in case of strategic or critical items which require maintenance of high quality might be procured through centralised system. Centralised system is also effective in case of procurement of capital goods and intellectual services which require high investment and high expertise. On the other hand, routine and leverage items might be procured through decentralised system.

- In order to remove the lead time constraints a hybrid system can be adopted by the organisations in the public sector. Some organisations are successfully carrying out such hybrid system. For example, Bangladesh Rural Electrification Board (REB) has been following the CLAN approach since 2006 in case of procurement of O & M materials. Previously it followed the centralised system. All O & M materials were purchased by a Procurement Directorate of REB. On getting allocation from appropriate authority of REB, PBS received materials from any of the warehouses. This centralised system caused some problems like overburden of work pressure on a single Procurement Directorate, problems relating to appropriate demand forecasting resulting in shortage or proliferation of stock, huge monetary involvement for large quantity purchase etc.

- The Economic Census project authority can adopt such system. For example, in case of procurement of pencil the Economic Census Project authority can make the specification of a standard pencil needed for the census operation and instruct all the field offices to purchase it according to that specification. Monitoring can be made by the project authority through field level inspection or keeping its staff in the purchase committee constituted by the field offices. This procedure will remove the lead time constraints keeping the quality of pencil intact. Other routine items such as papers, bags, banners, posters etc. can easily be procured by the field offices with some sorts of monitoring by the project office.

5.3 Concluding remarks

The study reveals that the present process of centralised purchasing is effective for the Economic Census with a problem in lead time which should be addressed. But it might not be equally effective for other enterprises in public sector in Bangladesh. It depends on the

degree of significance on cost, quality and time put forward by that particular enterprise. So the cost-quality-time triangle or “the iron triangle” in which a balance is stricken between the three has to be considered in case of public procurement. In doing so, a hybrid system is deemed more effective. This system has been running successfully in a public sector enterprise named REB.

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Appendix-A Sample Questionnaires

BRAC Institute of Governance and Development (BIGD)

BRAC University, Dhaka.

Thesis topic:

Effectiveness of centralized procurement system in public sector enterprise of Bangladesh: a focus on Economic Census 2013.

Questionnaire for BBS officials

[This research proposal is just for BRACU requirement as a part of academic discipline of Masters Degree. This survey questionnaire is prepared for obtaining opinion relating to the effectiveness of centralised procurement system in Economic Census 2013 project.]

Part A: Demographic Information

1. Name & designation (optional):
2. Length of Service:
3. Last Academic Degree:

Part B: Questionnaires

The following questions deal with the present practice of procurement. You are requested to explain and share your opinion: -

Question 1(a): Would you please mention past and present procedure of procurement of goods by Economic Census?

Question 1(b) : Do you find any distinction between past and present procedure ? (Please tick the right answer)

Ans: Yes/No

Question 1(c) : If yes, please state main points of distinction.

Question 2: Would you please state remarkable advantages of present procedure of purchasing?

Question 3: Would you please state remarkable weaknesses of present procedure of purchasing?

Question 4:(a) Please mention extent to which the “quality” of procured materials improved by following the centralised system of procurement.

| | | | | | |
|----------------------------------|---|---|---|---|---|
| Quality improvement of materials | 1 | 2 | 3 | 4 | 5 |
|----------------------------------|---|---|---|---|---|

1= Significantly Deteriorated, 2= Deteriorated, 3= Same as before, 4= Improved, 5= Significantly Improved

Question 4:(b) Do you think the Economic Census ensure better “price” of goods and services through present procurement practices? (Please put tick mark)

Ans : Yes /No

Question 4:(c) If the answer of question no 4(b) is yes; please specify the scale of economy:

| | | | | | |
|-------------------------------|---|---|---|---|---|
| Scale of better price ensured | 1 | 2 | 3 | 4 | 5 |
|-------------------------------|---|---|---|---|---|

1= Significantly Expensive, 2= Expensive, 3= Same as before, 4= Economical, 5= Significantly Economical

Question 4:(d) Please specify extent to which the “lead time” of delivering materials improved.

| | | | | | |
|--------------------------|---|---|---|---|---|
| Improvement of lead time | 1 | 2 | 3 | 4 | 5 |
|--------------------------|---|---|---|---|---|

1= Significantly Deteriorated, 2= Deteriorated, 3= Same as before, 4= Improved, 5= Significantly Improved

Question 4: (e) How effective the present procedure is? (Please tick the appropriate box)

| | | | | | |
|------------------------------------|---|---|---|---|---|
| Effectiveness of present procedure | 1 | 2 | 3 | 4 | 5 |
|------------------------------------|---|---|---|---|---|

1= Very Poor, 2= poor, 3= Acceptable, 4= Good, 5= Very Good, 6= Excellent

Appendix-B

Tables

Distribution of responses for questions nos 4(a), 4(c), 4(d) & 4(e)

Question 4: (a) Please mention the extent to which the “quality”of procured materials improved by following the centralised system of procurement.

(Table # A-1)

| Responses | Frequency | | | | | Total Frequency |
|---------------------------|----------------------------|--------------|----------------|----------|------------------------|-----------------|
| | Significantly Deteriorated | Deteriorated | Same as before | Improved | Significantly Improved | |
| Distribution of responses | 0 | 2 | 2 | 3 | 3 | 10 |
| Percentage of responses | 0 | 20 | 20 | 30 | 30 | 100 |

Question 4: (c) If the answer of question no 4(b) is yes; please specify the economy of scale:

(Table # A-2)

| Responses | Frequency | | | | | Total Frequency |
|---------------------------|-------------------------|-----------|----------------|------------|--------------------------|-----------------|
| | Significantly Expensive | Expensive | Same as before | Economical | Significantly Economical | |
| Distribution of responses | 0 | 2 | 2 | 4 | 2 | 10 |
| Percentage of responses | 0 | 20 | 20 | 40 | 20 | 100 |

Question 4:(d) Please specify the extent to which the “lead time”of delivering materials improved.

(Table # A-3)

| Responses | Frequency | | | | | Total Frequency |
|---------------------------|----------------------------|--------------|----------------|----------|------------------------|-----------------|
| | Significantly Deteriorated | Deteriorated | Same as before | Improved | Significantly Improved | |
| Distribution of responses | 4 | 4 | 2 | 0 | 0 | 10 |
| Percentage of responses | 40 | 40 | 20 | 0 | 0 | 100 |

Question 4: (e) How effective the present system is ? (please tick the appropriate box)

(Table # A -4)

| Responses | Frequency | | | | | | Total Frequency |
|---------------------------|-----------|------|------------|------|-----------|-----------|-----------------|
| | Very Poor | poor | Acceptable | Good | Very Good | Excellent | |
| Distribution of responses | 0 | 1 | 4 | 2 | 2 | 1 | 10 |
| Percentage of responses | 0 | 10 | 40 | 20 | 20 | 10 | 100 |